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FLOOD INSURANCE STUDY

VILLAGE OF WAYNE, ILLINOIS

KANE AND DU PAGE COUNTIES

JUNE 1, 1981

federal emergency management agency
federal insurance administration

COMMUNITY NUMBER - 170865

FEMI. 209:

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PUBLISHED SEPARATELY:

Flood Insurance Rate Map

FLOOD INSURANCE STUDY

VILLAGE OF WAYNE,
KANE AND DU PAGE COUNTIES, ILLINOIS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Village of Wayne, Kane and Du Page Counties, Illinois, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study will be used to convert the Village of Wayne to the regular program of flood insurance by the Federal Insurance Administration (FIA). Local and regional planners will use this study in their efforts to promote sound flood plain management.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than those on which these Federally-supported studies are based. These criteria take precedence over the minimum Federal criteria for purposes of regulating development in the flood plain, as set forth in the Code of Federal Regulations at 44 CFR, 60.1 (d). In such cases, however, it shall be understood that the state (or other jurisdictional agency) shall be able to explain these requirements and criteria.

1.2 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by the U.S. Army Corps of Engineers, Chicago District, for the Federal Insurance Administration, under Inter-Agency Agreement No. IAA-H-8-78, Project Order No. 13. This study was completed in February 1980.

1.3 Coordination

Streams requiring detailed study were identified at the initial coordination meeting attended by representatives of the U.S. Army Corps of Engineers (COE), the FIA, the state, and the Village of Wayne in December 1977. A legal notice, "Intent to Perform Flood Elevation Study," was published in the St. Charles Chronicle as required by FIA guidelines.

On January 16, 1981, the results of the work by the Study Contractor were reviewed and accepted at a final coordination meeting attended by representatives of the FIA, the Study Contractor, and the Village of Wayne.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of Wayne, Kane and Du Page Counties, Illinois. The area of study is shown on the Vicinity Map (Figure 1).

The areas studied by detailed methods were selected with priority given to all known flood hazard areas, and areas of projected development or proposed construction for the next five years, through February 1985.

Approximate methods of analysis were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to and agreed upon by the FIA and the Village of Wayne.

Floods along Norton Creek and Norton Creek Tributary were studied in detail within the corporate limits of Wayne. Flooding from two unnamed creeks located in the north section of Wayne were studied by approximate methods.

2.2 Community Description

The Village of Wayne is located in northeastern Illinois, about 40 miles west of downtown Chicago. Wayne is bordered on all sides by unincorporated Kane and Du Page Counties. Wayne is located in northeast Kane County and northwest Du Page County. The village is primarily a residential community. The population of Wayne in 1970 was 572 (Reference 1). The total land area was 2.3 square miles in 1970.

The climate of the basin is best described as humid continental with warm to hot summers and moderately cold winters in Illinois. The seasons are markedly distinct and generally lag three to five weeks behind the solstices. The proximity of Lake Michigan to the study area has a moderating effect on this climate. The average annual temperature in the basin is about 50 degrees Fahrenheit (F.). Average monthly temperatures vary from 20 degrees F. in January to 75 degrees F. in July, with extremes ranging from -25 degrees F. to 112 degrees F. (Reference 2).

Precipitation within the watershed occurs as rain, sleet, snow, and hail, with average annual precipitation amounting to 34 inches in Illinois. About 60 percent of the annual rainfall occurs from April to September. The annual evaporation is slightly less than the average annual rainfall, with the annual runoff being approximately 24 inches. The basin is subject to intense storms of short duration (Reference 2).

The topography of the Norton Creek watershed is characterized by rolling morainal hills marking western portions of the basin. The land east of these hills forms a gently rolling plateau to the eastern boundary of the watershed. These differing land forms produce an asymmetrical topography with the eastern portion of the basin attaining greater elevations than the western portion. The highest points in the basin are found on the eastern

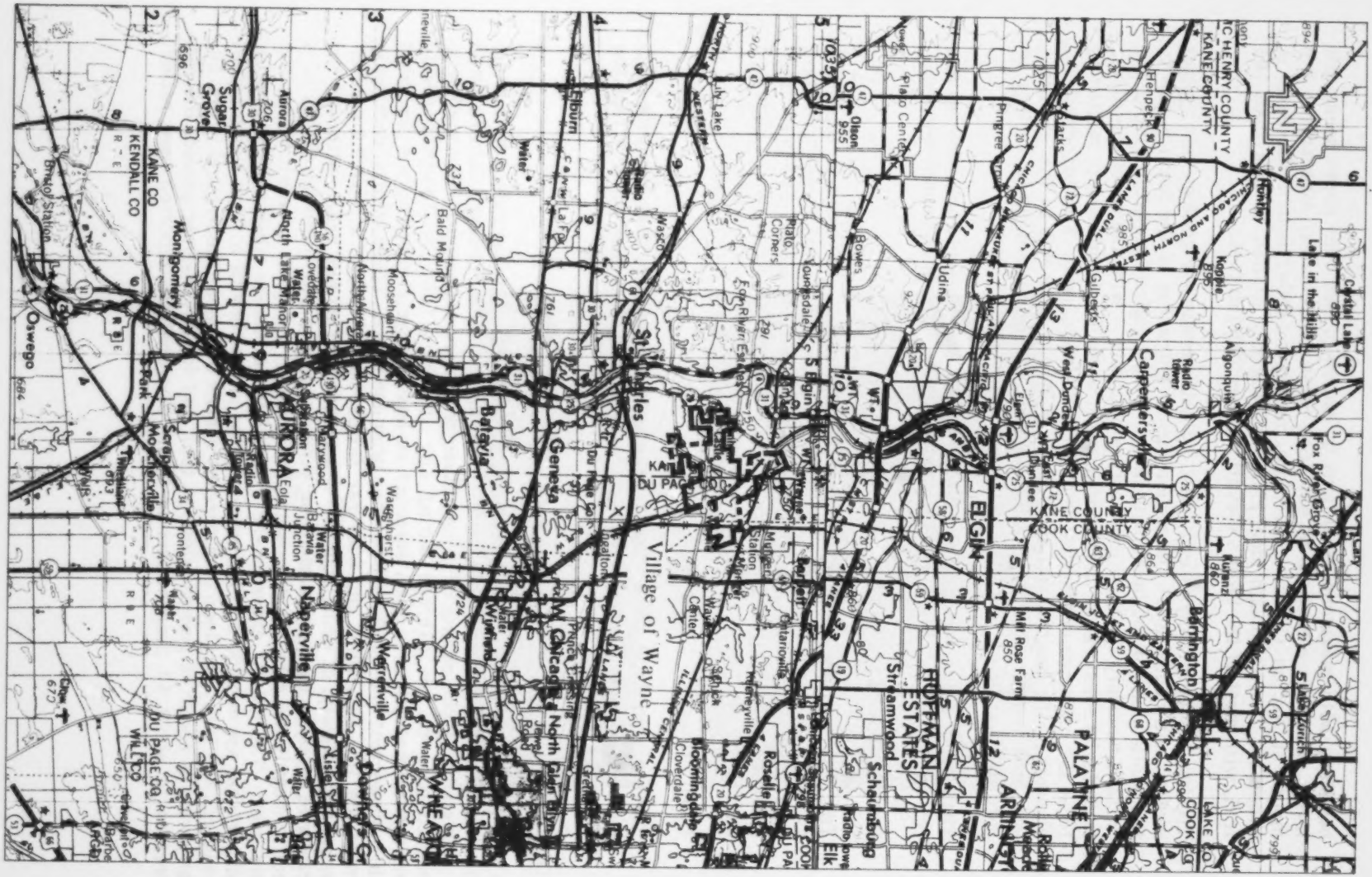


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

VILLAGE OF WAYNE, IL
(KANE AND DU PAGE COUNTIES)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

boundary with maximum elevations in excess of 800 feet above mean sea level. Minimum elevations of 690 feet occur immediately adjacent to the mouth of Norton Creek. Therefore, maximum relief within the basin is about 110 feet, although local relief is generally limited to less than 100 feet, with most of the basin's elevations near 750-780 feet.

The basin's topography is controlled by both subsurface geology and glacial erosion and deposition. The asymmetrical character of the basin is due to the gentle slope of the bedrock units from their highest elevations along the eastern boundary down to the western boundary. With the recession of the last glacial sheet, large blocks of ice that were formerly buried, melted to form the moraines in the west end of the drainage basin. Few topographical changes in the basin have occurred since glacial time due to low gradients with the basin. The vegetation consists of the Oak-Hickory variety of hardwoods.

The flood plain for Norton Creek is mostly undeveloped with a few residential homes. The Norton Creek Tributary flood plain is undeveloped.

2.3 Principal Flood Problems

The primary cause of flooding in the Norton Creek basin is usually a combination of snowmelt and rainfall events. The Norton Creek Tributary overflowed its banks on June 10, 1967. The calculated 100-year flood elevations at the White Thorn Road and Wood bridges are shown in Figures 2 and 3.

2.4 Flood Protection Measures

There are no flood protection structures or measures such as concrete-lined channels, detention ponds, storage reservoirs, or local laws which affect the study area.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equalled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance premium rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equalled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than one year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (one percent chance of annual occurrence) in any 50-year period is about 40 percent (four in ten), and for any 90-year period, the risk increases to about 60 percent (six in ten). The analyses reported here reflect

FIGURE 2 - The 100-year flood elevation at White Thorn Road bridge over Norton Creek.

FIGURE 3 - The 100-year flood elevation at Wood bridge over Norton Creek near dam.

flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail affecting the community.

There are no streamflow recording gages on Norton Creek. In order to simulate flows for Norton Creek and Norton Creek Tributary, a regional frequency analysis has been completed for the gages in the vicinity of the Norton Creek drainage basin. Thirteen U.S. Geological Survey (USGS) gages with one to 20 years of records in the Du Page River drainage basin provided data for the regional frequency analysis. To enable the regional frequency model to more accurately predict the flows for a small basin, the Du Page data have been augmented by records from gages with small drainage areas. Also included in the study are six gages from Du Page County basin having drainage areas of less than 20.0 square miles and six gages from basins within the region having drainage areas less than 2.0 square miles. The technique for a regional frequency analysis outlined in Bulletin No. 17 from the U.S. Water Resources Council (Reference 3) has been used to calculate the discharges for Norton Creek and Norton Creek Tributary.

Peak discharges for the 10-, 50-, 100-, and 500-year floods of each flooding source studied in detail in the community are shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
NORTON CREEK					
Upstream of the confluence of Norton Creek Tributary	3.46	365	555	645	870
At Dunham Road	4.82	438	665	771	1,038
NORTON CREEK TRIBUTARY					
At mouth	1.78	205	310	360	485

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the streams in the community were carried out to provide estimates of the elevations of the floods of the selected recurrence intervals along each flooding source studied in detail.

Cross sections for the backwater analyses were determined from field surveys with some overbank cross sections being determined from topographic maps at a scale of 1:4800, with a contour interval of four feet (Reference 4). Cross section locations were at close intervals above and below bridges, dams, and culverts in order to compute the significant backwater effects of these structures.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2).

Roughness coefficients (Manning's "n") were determined by field inspection and engineering judgment. The values range from 0.045 to 0.15 for the channel and 0.05 to 0.15 for the overbank section of Norton Creek. The values for Norton Creek Tributary range from 0.03 to 0.055 for the channel and from 0.045 to 0.055 for the overbank section.

The starting downstream water-surface elevations used in the HEC-2 step-backwater program was computed by the normal depth methods (Reference 5). Water-surface elevations of floods of the selected recurrence intervals on Norton Creek and Norton Creek Tributary were computed through use of the COE HEC-2 step-backwater computer program (Reference 5). This program relates stream geometry, characteristics, and discharge to stream elevation. Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot (Exhibit 1).

Flood elevations can often be increased by ice jams during spring thaws or by debris clogging bridges. The hydraulic analyses for this study, however, are based only on the effects of unobstructed flow. The flood elevations as shown on the profiles are thus considered valid only if hydraulic structures in general remain unobstructed and do not fail.

All elevations are referenced from National Geodetic Vertical Datum of 1929 (NGVD); elevation reference marks used in the study are shown on the maps.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FIA as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100-year and the 500-year floods have been delineated using the elevations determined at each cross section; between cross sections the boundaries were interpolated using topographic maps at a scale of 1:4800, with a contour interval of four feet (Reference 4). The 100-year approximate flood boundaries were taken from the Flood Hazard Boundary Map (Reference 6).

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 2). Small areas within the flood boundaries may lie above the flood elevations and, therefore, not be subject to flooding; owing to lack of detailed topographical information or to limitations of the map scale, such areas are not shown. In cases where the 100-year and the 500-year flood boundaries are close together, only the 100-year boundary has been shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood may be carried without substantial increases in flood heights. Minimum standards of the FIA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. In Illinois, though, under Revised Statutes, Section 65f, Chapter 19 as amended 1973 (Reference 7), encroachment in the flood plain is limited to that which will cause only an insignificant increase in flood heights. Thus, at the recommendation of the Division of Water Resources, a floodway having no more than a 0.1 foot surcharge has been delineated for this study.

The floodway proposed for this study was computed on the basis of equal conveyance reduction from each side of the flood plain. The results of these computations are tabulated at selected cross sections of each stream studied (Table 2). Portions of the floodway may lie outside the corporate limits.

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close together or collinear, only the floodway boundary has been shown.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE
NORTON CREEK							
A	10,190	198	924	0.9	725.1	725.0	0.1
B	10,993	185	556	1.5	726.0	725.9	0.1
C	12,228	103	471	1.8	728.7	728.6	0.1
D	13,416	136	476	1.8	732.0	732.0	0.0
E	14,298	193	596	1.4	734.5	734.5	0.0
F	15,196	172/130[2]	562	1.5	736.7	736.6	0.1
G	16,051	94	619	1.2	740.9	740.8	0.1
H	17,134	194/ 70[2]	1202	0.6	741.3	741.2	0.1
I	19,277	101	384	1.7	741.6	741.5	0.1
J	20,645	221	598	1.1	741.9	741.8	0.1
K	21,749	362	802	0.8	742.2	742.1	0.1
L	23,047	176	160	4.0	742.7	742.6	0.1
M	25,017	283	665	1.0	745.4	745.3	0.1
NORTON CREEK TRIBUTARY							
A	1010	301	959	0.4	741.5	741.4	0.1
B	1920	87	335	1.1	743.1	743.0	0.1
C	3200	186	315	1.1	743.3	743.2	0.1
D	4110	209	510	0.7	744.4	744.3	0.1
E	4470	12[3]	53	6.8	744.9	744.8	0.1
F	5740	95[3]	279	1.3	746.2	746.1	0.1

[1]FEET ABOVE MOUTH
[2]TOTAL WIDTH / WIDTH WITHIN CORPORATE LIMITS
[3]THIS WIDTH IS BEYOND CORPORATE LIMITS

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

VILLAGE OF WAYNE, IL
(KANE AND DU PAGE COS.)

FLOODWAY DATA

NORTON CREEK - NORTON CREEK TRIBUTARY

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 0.1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 4.

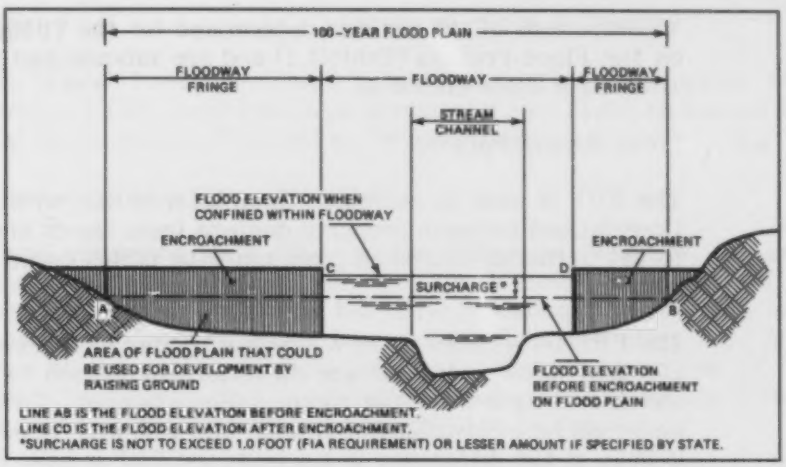

100-YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE AB IS THE FLOOD ELEVATION BEFORE ENCROACHMENT.
LINE CD IS THE FLOOD ELEVATION AFTER ENCROACHMENT.
*SURCHARGE IS NOT TO EXCEED 1.0 FOOT (FIA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FIGURE 4 - Floodway Schematic

The floodways in this report are recommended to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the FIA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHF), and flood insurance zone designations for each flooding source affecting the Village of Wayne.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

Average Difference Between 10- and 100-year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the Village of Wayne are shown on the Flood Profiles (Exhibit 1) and are summarized in the Flood Insurance Zone Data Table (Table 3).

5.2 Flood Hazard Factors

The FHF is used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHFs are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest 0.5 foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the entire incorporated area of the Village of Wayne was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A: Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations are shown or FHFs determined.

Zones A2, A3: Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations are shown, and zones subdivided according to FHF.

Zone B: Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year

flood by dike, levee, or other water control structure; or areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.

Zone C: Areas of minimal flooding.

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Village of Wayne is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the FIA.

6.0 OTHER STUDIES

The unpublished Flood Insurance Studies for unincorporated areas of Du Page County (Reference 8), the Village of Valley View (Reference 9), and the Village of Bartlett (Reference 10) were utilized in the development of and are in agreement with this study. A Comprehensive Plan for the Fox River (Reference 2) was also taken into consideration in the preparation of this report and was in agreement with this study.

A Flood Hazard Boundary Map has been published by the Federal Insurance Administration (Reference 6). The differences between the Flood Hazard Boundary Map and this study are justified due to the more detailed nature of this Flood Insurance Study.

This report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the National Flood Insurance Program.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic and other pertinent data used in this study can be obtained by contacting the Insurance and Mitigation Division, Federal Emergency Management Agency, One North Dearborn Street, Chicago, Illinois 60602.

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
NORTON CREEK							
REACH 1	0002	–1.5	–0.5	0.9	015	A3	VARIES–SEE MAP
REACH 2	0004	–0.8	–0.1	0.5	010	A2	VARIES–SEE MAP
NORTH CREEK TRIBUTARY							
REACH 1	0002,0004	–1.5	–0.5	0.7	015	A3	VARIES–SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

VILLAGE OF WAYNE, IL
(KANE AND DU PAGE COS.)

FLOOD INSURANCE ZONE DATA

NORTON CREEK - NORTON CREEK TRIBUTARY

8.0 REFERENCES AND BIBLIOGRAPHY

1. U.S. Department of Commerce, Bureau of the Census, Census of Population, Number of Inhabitants, Illinois, Washington, D.C., 1971.

2. Southeastern Wisconsin Regional Planning Commission, Planning Report No. 12, Volumes One and Two, A Comprehensive Plan for the Fox River Watershed, Waukesau, Wisconsin, April 1969.

3. U.S. Water Resources Council, Hydrology Committee, Bulletin No. 17, Guidelines for Determining Flood Flow Frequency, March 1976.

4. U.S. Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:4800, Contour Interval four feet: Wayne, Illinois, 1962, (photorevised) 1972.

5. U.S. Army Corps of Engineers, Hydrologic Engineering Center, Computer Program 723-X6-L202A, HEC-2 Water-Surface Profiles, Davis, California, February 1972.

6. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Village of Wayne, Illinois, August 1976.

7. Illinois Department of Transportation, Division of Water Resources, Rules and Regulations, Regulation of Construction Within Flood Plains Established Pursuant to Section 65F, Chapter 19, Illinois Revised Statutes, Springfield, Illinois, 1973.

8. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Unincorporated Areas of Du Page County, Illinois, (in progress).

9. ----------, Flood Insurance Study, Village of Valley View, Illinois, (in progress).

10. ----------, Flood Insurance Study, Village of Bartlett, Illinois, (in progress).

North Central Corps of Engineers District, Hydraulics, Memorandum for File, Fox River, Special Flood Hazard Study Chain of Lakes, McHenry and Lake Counties, Illinois.

Guidelines for Operational Procedures at McHenry Dam, Illinois Division of Water Resources, 1977.

U.S. Army Corps of Engineers, Chicago District, Unincorporated Areas of McHenry County. The Sidwell Company: West Chicago, Illinois, September - October 1978.

————————, Hydrologic Engineering Center, Computer Program 723-X6-L7550, Flood Flow Frequency Analysis, June 1976.

————————, Computer Program 823-X6-L2010, HEC-1: Flood Hydrograph Package, Davis, California, January 1973.

————————, Special Project Memo No. 412, Des Plaines River Basin, Duplicate Lock Hydrology Study, September 1973.

————————, Special Project Memo No. 415, Chicago Metropolitan Area Study, Du Page River Basin, October 1973.

U.S. Department of Agriculture, Soil Conservation Service, Urban Hydrology for Small Watershed, Technical Release No. 55, January 1975.

U.S. Department of Commerce, Weather Bureau, Technical Paper No. 40, Rainfall Frequency Atlas of the United States (for durations from 30 minutes to 24 hours and return periods from 1-100 years), Washington, D.C., May 1961.

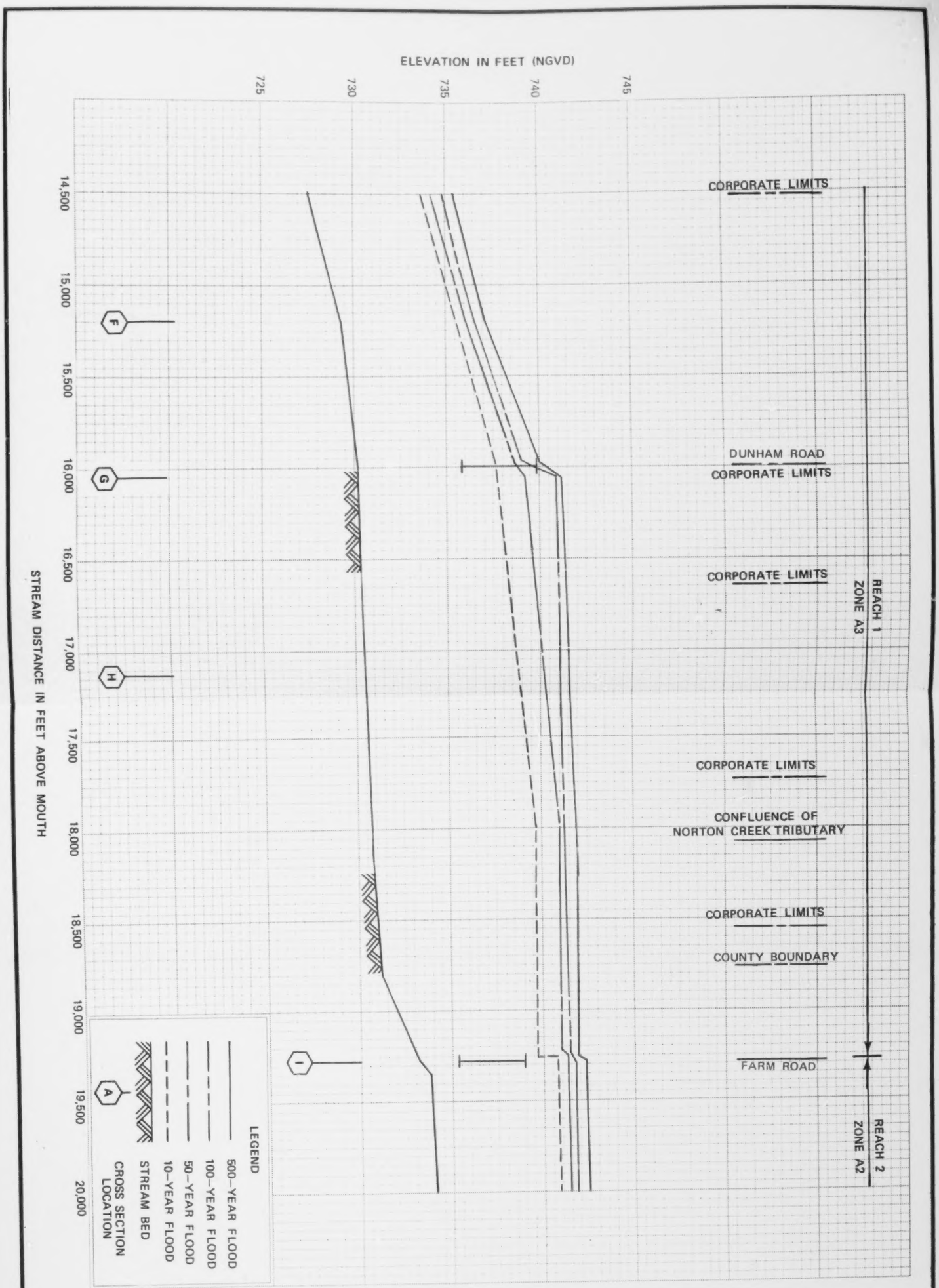
FLOOD PROFILES

NORTON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

VILLAGE OF WAYNE, IL
(KANE AND DU PAGE COS.)

01P



02P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

VILLAGE OF WAYNE, IL
(KANE AND DU PAGE COS.)

FLOOD PROFILES

NORTON CREEK

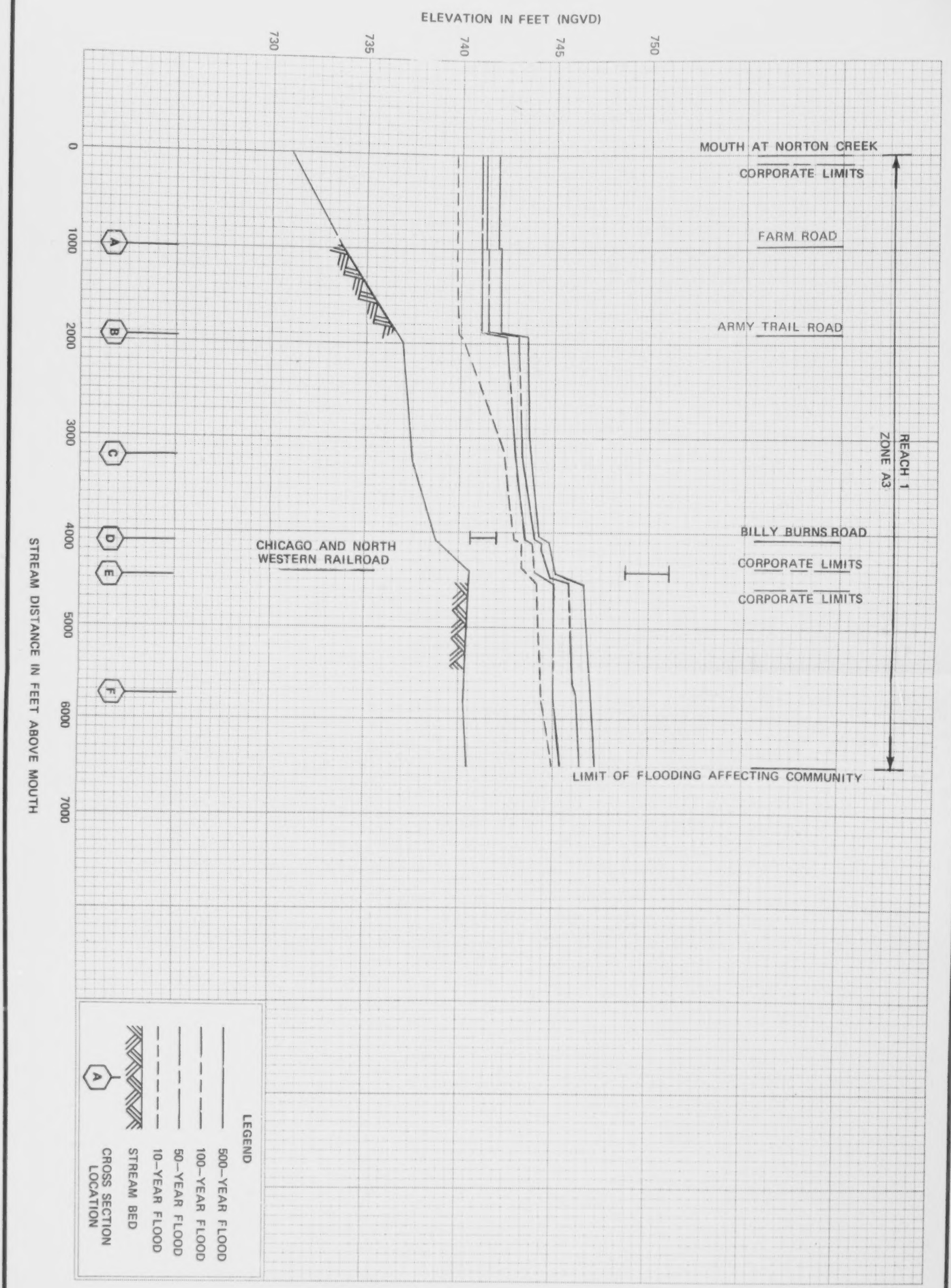
FLOOD PROFILES

NORTON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

VILLAGE OF WAYNE, IL
(KANE AND DU PAGE COS.)

03P



04P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration
VILLAGE OF WAYNE, IL
(KANE AND DU PAGE COS.)

FLOOD PROFILES

NORTON CREEK TRIBUTARY